solution to modern central treatment and collective conveyance of sewage as is proposed in the Proposed Alternative.

This alternative was finally rejected due to its potentially greater impact on the GCWA and the fact that, LIC advises, existing off-site infrastructure investments that are currently in excess of $14 million must ultimately be recouped in the sale price of the land as some number of parcels. This investment has been made already, intending to serve several thousand units, and it is far in excess of what would have been required for a low density large lot community in the same area and one that would then be competing in the same market for the same buyer as other large lot communities surrounding Master Phases I and II. Lot cost is affected dramatically by the requirement to recover the $14 million plus interest in the sale of the land as subdivided parcels. The addition of the off-site infrastructure cost would make the large lot sale price uncompetitive in the marketplace, not likely to be sold, and at the same time offers no environmental advantage over other preferred concepts.

4.4 Alternative Four – No Action

This alternative assumes that the proposed development of the Property does not occur and that no application for an incidental take permit is processed. Under this alternative, the Applicant would not construct the Cibolo Canyon Community project as it is described in the Proposed Alternative section. The Applicant would abandon any plans for future use of the Properties. Under the No Action alternative, the entire Master Phase II of Cibolo Canyon Property would continue to be used for ranchland and hunting. Ranching would include activities such as juniper clearing and raising livestock. In the likely event that revenues from ranching and hunting could not recover infrastructure expenses accrued to date and/or cover the ongoing expenses, the Applicant would have to pursue other methods to cover expenses of its ownership or sell the Property to a third party. Acquisition by a third party would likely require them to consider similar means to compensate for the ongoing expenses of the Property. This alternative provides an unlikely means of recovering economic value for the Applicant; therefore, the Applicant chose not to pursue this option.

5.0 ENVIRONMENTAL CONSEQUENCES

5.1 Alternative One – Proposed Alternative

5.1.1 Direct Impacts

As defined in Council on Environmental Quality (CEQ) regulations (40 CFR § 1508.8), "direct effects" are effects which are caused by the action and occur at the same time and place. Effects and impacts as used in these regulations are synonymous. Effects includes ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative. Effects may also include those resulting from actions which may have both beneficial and detrimental effects, even if on balance the agency believes that the effect will be beneficial

Although development and construction of the Property will disturb vegetation on-site and reduce habitat for wildlife, including the potential destruction and degradation of GCWA habitat, implementation of the Proposed Alternative is expected to offset such impacts to the maximum extent practicable through avoidance, minimization, and mitigation efforts as described in Section 6.0.

5.1.1.1 Vegetation

Of the 1,606 acres of the Property, 846 acres of upland areas is where the development identified in the Proposed Alternative will occur. Within the 846 acre Development Area, native vegetation will be modified and replaced with structures of various sorts, golf turf, and landscaped areas. Landscaping will be performed with native vegetation to the maximum extent possible. In addition, the native vegetation within substantial portions of the larger development envelope will be preserved in smaller greenbelts and setbacks. While these areas of preserved native vegetation are a component of minimizing the impact on this resource in general, they are not counted as mitigation for impacts to GCWA habitat. The remaining approximate 760 acres of undisturbed vegetation within the Property will be set aside as the Conservation Area and provide habitat for the GCWA.

5.1.1.2 Wildlife

Wildlife within those areas planned for development would largely be displaced to adjacent designated open space during the construction process. Such displacement could result in increased competition for breeding, nesting, and foraging habitat, as well as cover, in adjacent undisturbed habitat. Outside of designated open space, the promotion of urban wildlife species and human activities related to the proposed development may result in the decline of more specialized species in general.

Urban development often results in increases in generalist species, or species that are successful within a wide range of habitat including human-impacted areas. Increases in species that are habitat generalists (e.g., crows, jays, and mice) often occur at the expense of species with narrower habitat requirements. Possible introduction and/or increase of predators such as house cats, crows, and jays can have an impact on wildlife communities, particularly nesting birds.

5.1.1.3 Threatened or Endangered Species

Golden-cheeked Warbler

The Property provides habitat of varying quality for the GCWA. Habitat in this context is not limited to just breeding habitat, but also includes foraging and sheltering habitat. During the course of a breeding season it is expected the GCWA could be found exhibiting breeding, feeding, and/or sheltering behavior at locations across much of the Property. As described below, the proposed HCP will result in the modification of some habitat and the preservation of other habitat as mitigation.

Implementation of the Proposed Alternative will result in the destruction or adverse modification of 846 acres of GCWA habitat. At various times during the previous survey efforts, GCWAs have been observed utilizing locations across essentially the entire 846-acre development

envelope (Figure 4). These surveys, however, have been conducted at a "presence/absence" level of effort, thus limiting the ability to either delineate or reliably count GCWA territories that may have been present. Based on its review of all of the survey data, however, the Service has estimated that as many as 8 territories have been supported, or partially supported, within the proposed Development Area. Under the Proposed Alternative, clearing in all areas of GCWA habitat would occur during the time of year when the GCWA has migrated and is not present. Potential impacts to the GCWA could occur when returning individuals find previous habitat areas have been modified and as a result, there has been a general reduction in available habitat.

GCWA surveys on the North Triangle and Wolverton Tracts have estimated that 12 GCWA territories have been supported, or partially supported, within the approximately 760 acres of the proposed Conservation Area (Figure 4).

No Critical Habitat has been designated for this species. Therefore, none will be impacted.

Black- capped Vireo

Habitat evaluations conducted by Horizon and aci concluded that the vegetation of the Property lacks the requisite shrub density and shrub species regularly occupied by the BCVI (aci, 2002a). No impacts to the BCVI are expected as a result of the proposed development. The Applicant has not requested take coverage for the BCVI and none would be granted by issuance of the Permit. No Critical Habitat has been designated for this species. Therefore, none will be impacted.

Karst Invertebrates

The Property is located in the Stone Oak karst fauna region. Of the nine endangered karst or cave-dwelling invertebrates known to occur in Bexar County, three species are known to occur in the Stone Oak karst fauna region. The Property is not designated by the Service as Critical Habitat for any of the endangered karst invertebrates. Extensive karst surveys of the Property have not revealed the presence of any endangered karst invertebrate habitat or species (see Section 3.5).

Field methods utilized to identify and evaluate potential karst features were intended to meet both the Service draft protocols (Versions May 8, 2000; April 8, 2001; and May 23, 2001) for identifying karst features and TCEQ criteria for Geologic Assessments on the Edwards Aquifer Recharge Zone. A total of 330 geologic features were mapped, which included 142 non-karst features such as fault zones, fractured rock outcrops, stream scours, and water wells. One-hundred-eighty-one (181) geologic features and ninety-nine (99) non-karst features were located within Master Phase I and one-hundred-forty-nine (149) geologic features and forty-three (43) non-karst features were located within Master Phase II. The investigations revealed the presence of 188 possible karst features on site. Excavation of 185 of these possible karst features revealed that the features rapidly constricted, had well developed soil horizons with compact clay at depth or exhibited no airflow. No habitat suitable for karst invertebrates was encountered at any of these 185 features. In accordance with the above-referenced protocols and methodology, excavation was performed by hand until encountering a cave, solid bedrock with no portals, packed clay with no airflow present, potential archaeological or paleological materials, or where continued excavation would be dangerous. No mechanical equipment was used. One of the three remaining karst features is an open cave known as Elm Waterhole Cave (located within Master Phase I). The two remaining features were excavated into voids large enough to enter. One of

the features is cave-sized and was named Stein Cave and is located within Master Phase II. The other feature is smaller than a cave and was called Peanut Sink and is located within Master Phase I.

Biological karst invertebrate collections performed by Warton & Associates did not reveal the presence of any endangered species in any of the three features entered. The Applicant has not requested take coverage for any karst invertebrate and none would be granted by issuance of this permit.

Edwards Aquifer Species

The Service has expressed concern that the combined current level of water withdrawal for all consumers from the Edwards Aquifer could adversely affect aquifer-related species located at Comal, San Marcos, Fern Bank, and Hueco Springs during low flows, and that effects on the Aquifer may also affect the Cagle's map turtle (*G. caglei)* (a candidate for listing). Regional efforts are expected to address the potential impacts to aquifer-related species from water quantity withdrawals (see Section 3.3.3).

Edwards Aquifer species are not found within the project area, and therefore, any possible effects to these species would be indirect and/or cumulative.

5.1.1.3.1 Assessment of Take

The Property has been evaluated for the federally-listed threatened or endangered species discussed under Section 3.3 above. Other than evidence of use of the Property by the GCWA there is no evidence of any other threatened or endangered species on Master Phase II. Past survey efforts have provided valuable information in determining the extent of GCWA occupation on the Property. However, it does not provide a precise mechanism for predicting the number of GCWAs that may actually be "taken" by the proposed action. The effectiveness of GCWA surveys in counting the number of birds in an area can be somewhat limited. For example, GCWA males are much more easily observed than females or fledglings during surveys due to their territorial behavior and frequent vocalization. Moreover, the GCWA occupation of a given area can vary significantly from year to year, and appears to have done so on this Property depending on a wide variety of factors. In addition, the impacts may not be fully felt in a single season and may be spread over several, or even many, years during which utilization of the site may vary quite significantly for reasons unrelated to the proposed community. For these reasons, it is not possible to predict a precise number of GCWAs that may, over time, be taken or preserved as a result of the proposed action. It is more accurate and appropriate to state that, over time an area that has been observed to support GCWAs may or may not be rendered unsuitable for the GCWAs. "Take" or mitigation, therefore, is not in this document characterized by a precise bird count, but by the loss or preservation of areas, the relative quality of which is in part determined by the levels of prior observed GCWA utilization as well as the assessment of vegetated assemblages and other factors that may or may not impact the GCWA.

The Proposed Alternative is expected to result in development of 846 acres of the overall 1,606 acres. Upon completion of Master Phase II, the viability of GCWA habitat within developed areas of the Property is uncertain for the reasons previously stated. Therefore, this modified GCWA habitat, which has been documented to support, or partially support as many as 8 GCWA

territories, will be mitigated by the preservation and management of approximately 760 acres, which has been observed to support or partially support at least 12 GCWA territories. Based upon topographic and vegetative characteristics, the area proposed for preservation likely supports, and with further management will support higher quality GCWA habitat.

5.1.1.3.2 Assessment of Take of Other Listed Species

The Property has been evaluated for the federally-listed threatened or endangered species discussed under Section 3.3 above. Other than evidence of use of portions of the Property by GCWAs, there is no evidence of any other threatened or endangered species on the Property (see Sections 3.3.1, 3.3.2, 3.3.3, and 5.1.1.3). It appears that no listed species, other than the GCWA, are likely to be present on or adjacent to the Property, and therefore it is unlikely that any such species will be taken or affected by development and operation of the Proposed Alternative.

5.1.1.4 Wetlands

Areas within the Property potentially subject to section 404 of the Clean Water Act are limited to the two drainages. Proposed development within the Property, except for limited infrastructure crossings, will be setback from these drainages by at least 50 feet (15.2 meters) or more depending on the specific location and size of contributing area. Runoff into these drainages is to be treated according to applicable local regulations and the COSA agreement (or an environmental protection program similar to those accepted in other local communities with similar uses) and the TCEQ Edwards Aquifer Rules and standards for construction-related pollution and sedimentation prevention. Wetlands, as defined by the criteria established in the 1987 USACE Wetlands Delineation Manual, do not exist on the Property. If planned activities would result in impacts to "waters of the U.S.", then LIC would seek authorization from the USACE prior to conducting such activities.

5.1.1.5 Geologic Features and Soils

Areas proposed for development are underlain by the Edwards group formation and Trinity group formations. Since soils are very thin and rocky, surface soil alterations in development areas, such as grading, will be minimized to the extent practical and will comply with all applicable TCEQ, Bexar County, COSA, and SAWS construction codes for erosion and sedimentation control during construction. Construction will require drilling, trenching, and excavation of limestone rock in order to install foundations, roadways, and utilities. Impacts to geologic features and soils are expected to be minor because all known features are located within open space, floodplains, and creek buffers and will be preserved per the COSA Agreement. All other sensitive geologic features, as defined by TCEQ guidelines and by a Geologic Assessment Committee established by the COSA, will be preserved. Non-sensitive features within areas of construction will be subject to closure and sealing or protection by one of a number of TCEQ specified Best Management Practices.

5.1.1.6 Land Use

The Property is currently ranchland used for hunting, cattle grazing, and similar agricultural uses. New development on the Property will consist of mixed-use commercial, residential, and resort development. The Proposed Alternative will result in the conversion of portions of the land from ranchland/open space to development. The proposed development is comparable and compatible with current land use in the area. Under this alternative, approximately 760 acres of open space would be preserved in conservation easements, approximately 500 acres (202.3 hectares) would be open space, or golf, and the overall development would be less than or equal to 15 percent impervious cover

5.1.1.7 Cultural Resources

All archaeological sites within the Evans Road Tract and Wolverton Tract portions of the Property will be directly impacted. However, these sites have very little research value and represent negligible cultural resources. Sites 41BX1561, 41BX1565 and 41BX1566, which are located in the North Triangle Tract, are located in undeveloped open space and will not be impacted by the proposed action. No sites that are eligible or potentially eligible for the National Register of Historic Places will be impacted.

5.1.1.8 Air Quality

Development of the Property will increase exhaust emissions by increasing the number of gas-powered vehicles on the Property. A reduction in the number of trees on the Property may slightly reduce air-filtering capabilities. A temporary increase in dust levels is expected during the construction process. These minor effects on air quality conditions are not expected to result in any significant impacts to air quality.

5.1.1.9 Water Resources and Water Quality

Possible water quality impacts to the Edwards Aquifer should be considered from two sources, water that infiltrates on-site and water that runs off the Property and potentially infiltrates downstream of the Property.

For the first area of consideration, water that infiltrates on-site recharges the Upper Trinity Aquifer. Groundwater recharge occurs primarily in streambeds (Metcalf and Eddy, 1979). Preservation of open space, floodplains, creek buffers, and sensitive geologic features within these areas will prevent significant losses of recharge to the Upper Trinity Aquifer. Studies have been conducted that identify evidence that some groundwater movement from the Upper and Middle Trinity Aquifer to the Edwards Aquifer occurs in some areas across faults (George, 1947, 1952; Small, 1986; Veni, 1997; EUWD Report 95-03). Movement of some groundwater from the upper member of the Glen Rose Formation to the Kainer Formation of the Edwards Group may occur across the Bat Cave Fault. The location of the fault as mapped by Pape-Dawson and Stein and Ozuna (1995) is presented on Figure 5. Recharge from the Glen Rose Formation to the Edwards Aquifer within the entire San Antonio Segment of the Edwards Aquifer is estimated to be probably less than two percent of the total recharge (EUWD Report 95-03). The EUWD Report 95-03 references cross sections by Small (1986) through the Edwards Aquifer Recharge

Zone (EARZ) that show areas in which faulting juxtaposes the Glen Rose Formation of the Trinity Aquifer and Edwards Group in the subsurface. These cross sections, water levels, and aquifer transmissivities were used to estimate the volume of flow across faults from the Glen Rose Formation to the Edwards Aquifer. A six-mile length of faulting in the area of the Property was estimated to transfer between 97 and 351 acre-feet of water per year from the Glen Rose to the Edwards. (EUWD Report 95-03). Total recharge from surface water to the San Antonio segment of the Edwards Aquifer is approximately 794,070 acre-feet averaged over the last ten years. This means that an equivalent of approximately 0.01 percent to 0.04 percent of total recharge in the San Antonio segment of the Edwards Aquifer might occur from the Glen Rose Formation of the Trinity Aquifer to the Edwards Aquifer in the area of the Property.

However, a recent detailed investigation conducted by SAWS on the "bad-water" line of the Trinity Aquifer suggests that faults between the Trinity Aquifer and Edwards Aquifer may be barriers to flow in Bexar County and in the area of the site. Mr. Alvin Schultz, consultant for SAWS, presented data at the November 12, 2003 meeting of the South Texas Geologic Society that indicate there is an approximately 40-foot (12.2 meters) difference in the potentiometric groundwater levels between the Trinity Aquifer and Edwards Aquifer in the vicinity of the Property. This difference in water levels was interpreted by Mr. Schultz as a possible indication that faults between the aquifers are barriers to flow. Mr. Schultz's detailed investigation also indicated that if groundwater flow from the Trinity Aquifer to the Edwards Aquifer was occurring, the water transferred was naturally-occurring, poor quality water with elevated concentrations of dissolved solids and sulfates.

In summary, some data indicate that flow may occur from the Glen Rose formation of the Trinity Aquifer to the Edwards Aquifer in the vicinity of the site equal to 0.01 to 0.04 percent of the total surface water recharge to the Edwards Aquifer San Antonio Segment. However, some recently collected data by SAWS consultant Mr. Alvin Schultz suggest faults between the Trinity Aquifer and Edwards Aquifer are barriers to flow in the vicinity of the site.

For the second condition where storm water runoff leaves the site and infiltrates downstream of the Property, no significant impacts to water resources or water quality are expected to occur due to the use of best management practices described elsewhere, herein. Development will take place in accordance with the TCEQ Edwards Aquifer Rules and in accordance with all applicable local ordinances and the stringent COSA Agreement between LIC, the COSA, and the SAWS. The following best management practices will be implemented under the Proposed Alternative:

- Limiting the imperious cover to 15 percent over the entire site. EPA studies have indicated that the concentrations of pollutants in urban runoff can be directly related to the degree of development, especially the amount of impervious cover. Limiting the impervious cover to 15 percent is one of the most effective ways to preserve the site's predevelopment runoff characteristics;
- 100-year flood plains and sensitive recharge features will be preserved. The golf courses will include buffer strips to the FEMA 100-year floodplain and sensitive features, protecting areas within both Master Phase I and Master Phase II;
- For non-golf course land, only organic fertilizers, pesticides, and herbicides may be used. No pesticide or herbicide applications will occur in buffer zone areas.
- Owner-educational materials related to BMPs for fertilizer & pesticide use and water conservation measures will be provided to property owners.

- Only native-scaping and low-water use landscapes will be permitted in landscaping lawns, ornamental landscape areas, greenbelts, and open space areas on the non-golf course land.
- An extensive monitoring plan in and around the Tournament Players Course San Antonio Golf Village golf course areas is included. Periodic monitoring of storm water runoff, golf course irrigation lakes, and monitoring wells will be conducted to evaluate the effectiveness of BMPs. Water analysis will cover a broad range of analytes including herbicides, pesticides, and fungicides used on the golf courses.
- Specific trigger levels have been established that will initiate further evaluation and modification of land management practices.
- Additionally, according to the Water Pollution Abatement Plan for this property, BMPs in accordance to the TCEQ's requirements will be utilized to treat storm water runoff from commercial and multi-family residential developments. These BMPs may include sedimentation/filtration basins, vegetative filter strips, retention/detention basins, and grassy swales.

In view of the comments and assessments made in creating the COSA agreement and the implementation of BMPs to improve the quality of the storm water runoff leaving the Property, no significant impacts to water resources and water quality are expected to occur from infiltration of storm water runoff downstream of the Property.

The closest receiving water on the State of Texas 1999 Clean Water Act Section 303(d) list is approximately 6.5 miles (10.5 km) downstream of the site. The Mid Cibolo Creek and Upper San Antonio River stream segments will receive water downstream of the site and are on the 303(d) list. These segments are on the list due to low dissolved oxygen concentration (Mid Cibolo) and bacteria levels exceeding criterion established to assure the safety of contact recreation (Upper San Antonio). The proposed site development should not significantly affect dissolved oxygen, bacteria levels, or other water quality parameters of these segments.

Annual water demand for the completed development is estimated to be 6,928 equivalent dwelling units or 2,078,400 gallons per day (average flow). This water is expected to be provided by SAWS, per the terms of the SAWS Agreement. In November 2002, LIC entered into a Water Service Agreement and a Water Provision Agreement with SAWS for the supply of potable and irrigation water, respectively. Each SAWS Water Agreement establishes terms and conditions under which SAWS will supply water for potable uses and for irrigation of golf course(s) and roadway medians within the boundaries of the Property. The ultimate water supply to the Property is limited under the Water Service Agreement for potable water service. The Water Provision Agreement limits the supply of water for irrigation uses and requires the transfer of all on-site groundwater well facilities and related rights from LIC to SAWS. The Master Phase II development is expected to purchase water from SAWS and all on-site groundwater wells and rights will be controlled by SAWS. SAWS operates under the regulation of the Edwards Aquifer Authority (EAA).

5.1.1.10 Socioeconomic Environment

The proposed development, construction, and occupation of the Property would result in construction and operation of mixed use residential, commercial, and other development with

attendant roads and utilities on almost all portions of the Property, excluding the designated Conservation Area. Development of this Property would provide additional commercial, residential, and may include resort areas.

Socioeconomic benefits in the form of jobs will occur when the project is under construction. The construction payroll over two years for the construction of each hotel, for example, is estimated to be $35,400,000 and over 18 months for the construction of two golf courses and a learning center is estimated to be $10,000,000. Additional jobs and benefits will be generated over approximately 15 to 30 years through the construction of single-family and multi-family residential developments. Other benefits include purchase of amenities such as materials, parts, food services, fuel, and lodging. The construction estimate for each hotel is approximately $150,000,000 - $175,000,000 and the construction estimate for two golf courses and a learning center is approximately $40,000,000.

In addition to socioeconomic benefits associated with the creation of jobs and increase in property values, LIC has voluntarily committed to the COSA to address social justice concerns raised during community discussions regarding possible golf and resort uses. LIC has contractually agreed to adopt a non-discrimination policy and adherence to an advocacy policy through efforts to comply with the City's contracting goals for small, minority or women-owned businesses for any golf and/or resort hotels in the community. LIC will submit a "Good Faith Effort Plan" documenting their efforts to employ qualified, historically under-utilized businesses. In addition, LIC agreed under the Proposed Alternative to impose certain wage standards for employees of each hotel and golf course.

5.1.2 Indirect Impacts

As defined in CEQ regulations (40 CFR § 1508.8), "indirect effects" are effects caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems. Effects and impacts as used in these regulations are synonymous.

5.1.2.1 Vegetation

Minimal indirect impacts to vegetation are expected due to off-site utility construction associated with the proposed development. This off-site utility construction will be for installation of sewer mains and will occur in currently undeveloped areas that are proposed for development by others.

5.1.2.2 Wildlife

The proposed development plan may result in the reduction of overall habitat available to local off-site wildlife species. However, the majority of the tract is surrounded by planned or existing development with the exception of the northern and northeastern boundaries. Therefore, potential indirect impacts will be buffered by the 760 acres of the Conservation Area included in the HCP.

5.1.2.3 Threatened or Endangered Species

Indirect impacts of this project pertaining to the GCWA may or may not include a reduction in overall nesting, foraging, and breeding habitat. Encroachment of noise and activity within close proximity of GCWA habitat, introduction or increase of predator species (e.g., scrub jays, cats), and increase of species that may compete with the GCWA for shelter, forage, and nesting resources (such as brown-headed cowbirds) are also potential indirect impacts of this development. These issues are considered in the Assessment of Take Section 5.1.1.3.1. The habitat identified as being preserved will likely experience some level of indirect impacts. These impacts may be lessened in the future as a result of a shift in the location of some birds away from the development. It is expected enough habitat will remain for these birds to persist.

These potential indirect impacts will be minimized and mitigated to the maximum extent practicable by the mitigation plan described in the HCP (Section 6.0) and by the synergism resulting from the combined effects of preserving adjacent tracts for the beginnings of a new, third GCWA preserve for this recovery area.

Onsite recharge
In the event that a small amount of water is transferred from the Trinity Aquifer to Edwards Aquifer, the water would then need to move into the artesian zone of the Edwards Aquifer and then move northeast greater than 15 miles (24.14 km) before reaching Comal Springs. Due to the lengthy path of fluid migration to Comal Springs, possible barriers to flow, and the enormous water volume and high transmissivity of the artesian zone of the Edwards Aquifer, the potential for an impact to water quality at Comal Springs from a contaminant originating at the subject Property is negligible.

In summary, some data indicate that flow may occur from the Glen Rose formation of the Trinity Aquifer to the Edwards in the vicinity of the site equal to 0.01 to 0.04 percent of the total surface water recharge to the Edwards Aquifer San Antonio Segment. However, some recently collected data by SAWS's consultant Mr. Alvin Schultz suggest faults between the Trinity Aquifer and Edwards Aquifer are barriers to flow in the vicinity of the site. Therefore, due to the relatively small volume of water that may or may not possibly be transferred to the Edwards Aquifer, the presence of possible barrier faults to flow, the lengthy flow path from the Trinity Aquifer to the Edwards Aquifer to Artesian Zone and then to Comal Springs, and the enormous water volume and high transmissivity of the Edwards Aquifer the overall potential impact to the aquifer-dependent species is negligible.

Surface water that leaves the property enters intermittent surface streams that flow across areas of the Edwards Aquifer Recharge Zone where Edwards strata are saturated and the Edwards Aquifer exists. Infiltration of surface water in these areas downgrade of the Property would recharge the Edwards Aquifer. TCEQ Edwards Aquifer Rules regulate activities having the potential for polluting the Edwards Aquifer and hydrologically connected surface streams in order to protect existing and potential uses of groundwater and maintain Texas Surface Water Quality Standards. As such, all development phases within the Property will be required to file a Water Pollution Abatement Plan and/or a Contributing Zone Plan with the TCEQ. In addition, construction of all wastewater facilities within the Recharge Zone will require the approval of a Sewage Collection System application from the TCEQ. The TCEQ Edwards Aquifer Rules require the

implementation of temporary BMPs to prevent the transport of sediment off the site during construction disturbances and the implementation of permanent BMPs for the removal of at least 80 percent of the incremental increase in the annual mass loading of total suspended solids from the site caused by development of the Property. In addition to the TCEQ regulations, the aforementioned COSA Agreement places additional restrictions and requirements on development if major portions of the Property are developed as the Golf Village destination resort under the Proposed Alternative. The measures are further described in the analysis of the Proposed Alternative.

Groundwater wells that will be used for irrigation on-site are completed in the Middle Trinity Aquifer. At SAWS request, these were drilled in place of the Applicant's proposal to utilize highly treated effluent for irrigation needs. Wells on-site are completed within the Middle Trinity Aquifer and can only produce water from the Middle Trinity Aquifer. Groundwater wells are spaced across the site and will not be pumped beyond the sustainable yield of the wells. Rainfall and recharge will periodically raise water levels and renew the groundwater resource. SAWS water, which is supplied by pumping of the Middle Trinity and Edwards Aquifers, will be utilized as the drinking water source and will supplement irrigation, if necessary. Therefore, no on-site pumpage of Edwards Aquifer water will be conducted or utilized for potable uses or irrigation. SAWS will supply water for residential and other commercial use. SAWS use of Edwards Aquifer is limited by the amount of water rights issued by the EAA. The EAA is developing a regional HCP for Edwards Aquifer dependent species that will govern pumping of the Edwards Aquifer.

In summary, no Edwards Aquifer pumping will occur on-site. SAWS water used for residential and commercial developments and irrigation supplements will be restricted by SAWS who is ultimately regulated by the EAA and will allow pumping in an amount that will comply with the regional HCP.

Offsite recharge

Stormwater exiting the site would be subject to COSA, Edwards Aquifer Authority, SAWS, and the State of Texas (TCEQ) regulations, standards and BMP requirements designed to preserve water quality in this and other portions of the Edwards Aquifer. The TCEQ Edwards Aquifer Rule (30 TAC 213) regulates activities having the potential for polluting the Edwards Aquifer and hydrologically connected surface streams in order to protect existing and potential uses of groundwater and maintain Texas Surface Water Quality Standards. As such, all developments within the Property will be required to file a Water Pollution Abatement Plan and/or a Contributing Zone Plan with the TCEQ. In addition, construction of all wastewater facilities within the Recharge Zone will require the approval of a Sewage Collection System application with the TCEQ. The TCEQ's Edwards Aquifer Regulations require the implementation of temporary BMPs to prevent the transport of sediment off the site during construction and the implementation of permanent BMPs for the removal of at least 80 percent of the incremental increase in the annual mass loading of total suspended solids from the site caused by development of the Property.

In addition to TCEQ regulations, the Proposed Alternative includes voluntary compliance with those regulations and utilization of BMPs where needed and appropriate within the residential, commercial, and other areas of the resort community. The Proposed Alternative is subject to the

aforementioned COSA Agreement that would place additional restrictions and requirements on the development. See Section 5.1.1.10 for additional information regarding the best management practices to be used.

Aquifer Water Withdraw
Six water wells have been drilled on-site and completed in the Middle Trinity Aquifer. The water quality produced is generally good but exhibits a hydrogen sulfide odor when initially exposed to air and has fluoride concentrations slightly in excess of primary drinking water standards in some wells.

Figure 6 is a cross section of the Property showing stratigraphic and hydrogeologic units and the groundwater levels measured in water wells drilled onsite. Based on geophysical logs of water wells drilled on-site by Pape-Dawson, groundwater depth varies at the Property but is generally at least 150 feet (45.7 meters) deep. The first water bearing unit is the upper member of the Glen Rose Formation or Upper Trinity Aquifer. The deeper lower member of the Glen Rose Formation and Cow Creek Limestone make up the Middle Trinity Aquifer. Deeper yet are the Sligo and Hosston Members of the Travis Peak Formation that make up the Lower Trinity Aquifer (Ashworth, 1983). No water bearing Edwards Aquifer unit exists within the Property because the Edwards Group rocks exposed at the ground surface are not saturated. Therefore, water that infiltrates on-site recharges the Upper Trinity Aquifer, not the Edwards Aquifer.

Any indirect impacts associated with Master Phase II increasing withdrawal of water from the Edwards Aquifer will be avoided, minimized, and/or mitigated through the measures described above. Indirect threats to the Aquifer species can best be effectively addressed on a regional, collective basis, and SAWS and the EAA are the two entities primarily responsible for implementing a regional conservation effort.

5.1.2.4 Wetlands

Proposed on-site sedimentation controls will minimize the amount of sediment and other storm water constituents introduced into any drainage on-site or downstream. No off-site indirect impacts to wetlands or jurisdictional waters are expected.

5.1.2.5 Geologic Features and Soils

No off-site indirect impacts to geologic or soil resources are expected to occur.

5.1.2.6 Land Use

No significant indirect impacts to existing or proposed land uses are expected to occur as a result of the proposed action, other than the combined effects of preserving adjacent tracts into the beginnings of a new, third GCWA preserve for this recovery region, as discussed elsewhere herein.

The majority of the properties adjacent to, or in the vicinity of, the Cibolo Canyon site, are currently developed or have existing master plans for development with clearing and construction

underway. The primary land use of surrounding properties is single-family residences that lack any significant green space preserve areas, other than community park-land requirements. For these properties that are developed or are planned for development near the Cibolo Canyon site, the proposed action will not change or impact the use of those properties. Approximately 635 acres (257 hectares) of ranchette sites along the southeastern side of the Cibolo Canyon Property has no current plans for further subdivision. These properties consist of large acreage tracts ranging in size from approximately 8 acres (3.2 hectares) to approximately 185 acres (74.9 hectares) with individual single-family homes located on each. The proposed action will not alter the use of these large acreage tracts, whose uses are subject primarily to the plans of the owners that may or may not be subject to future ESA review.

Development of the Property will increase traffic on area roadways. At full build-out, the Proposed Alternative is projected to result in peak hour traffic in excess of 3,065 AM peak hour trips and 3,847 PM peak hour trips with more than 42,000 daily trips. The significance of these trips was studied along with non-site traffic growth to assess the transportation impacts of the proposed action on the area thoroughfares including Bulverde Road, Evans Road, US Highway 281, the proposed Stone Oak Parkway Extension from US Highway 281 to Bulverde Road and the proposed Cibolo Canyon Boulevard within the Property. At full build-out of the proposed action, the traffic generated by the project is anticipated to account for approximately 10.2 percent of the traffic on Bulverde Road, 5.8 percent of the traffic on Evans Road, 52.4 percent of the traffic on Stone Oak Parkway Extension, and 73.9 percent of the traffic on Cibolo Canyon Boulevard. The remainder of the traffic is associated with existing or other proposed land uses. In addition, the capacity of key intersections was evaluated in terms of transportation standard Level of Service format. Level of Service is determined by the average delay a vehicle experiences on each intersection approach. The results of the intersection capacity analyses for six key intersections indicate that three of the intersections currently operate at unacceptable levels of service. At completion of the proposed action, non-site traffic is projected to cause unacceptable levels of delay resulting in poor levels of service at five of the six intersections. Only one intersection at US Highway 281 and Stone Oak Parkway Extension is reduced from an acceptable to unacceptable Level of Service as a result of the site traffic.

5.1.2.7 Cultural Resources

No indirect impacts to cultural resources are expected.

5.1.2.8 Air Quality

Development of the Property will indirectly increase exhaust emissions by increasing the number of gas-powered vehicles entering and on the Property over the number experienced at present. A reduction in the number of trees on the Property may slightly reduce air-filtering capabilities. These minor effects on air quality conditions are not expected to result in any significant indirect impacts to air quality.

5.1.2.9 Water Resources and Water Quality

Surface water that leaves the Property enters intermittent surface streams that flow across areas of the Edwards Aquifer Recharge Zone where Edwards strata are saturated and the Edwards Aquifer

exists. Infiltration of surface water in these areas downgrade of the Property would recharge the Edwards Aquifer. TCEQ Edwards Aquifer Rules regulate activities having the potential for polluting the Edwards Aquifer and hydrologically connected surface streams in order to protect existing and potential uses of groundwater and maintain Texas Surface Water Quality Standards. The proposed development phases within the Property will be required to file a Water Pollution Abatement Plan and/or a Contributing Zone Plan with the TCEQ. In addition, construction of all wastewater facilities within the Recharge Zone will require the approval of a Sewage Collection System application from the TCEQ. The TCEQ Edwards Aquifer Rules require the implementation of temporary BMPs to prevent the transport of sediment off the site during construction disturbances and the implementation of permanent BMPs for the removal of at least 80 percent of the incremental increase in the annual mass loading of total suspended solids from the site caused by development of the Property.

No significant off-site impacts to water resources and water quality are expected to occur. The COSA Agreement for the PGA golf areas stipulates additional water quality protection measures above those required by the TCEQ that will protect the quality of storm water leaving the Property. In addition, the COSA Agreement limits the amount of water utilized by the Proposed Alternative and requires all water to be supplied and controlled by SAWS. Thus, any impacts associated with Master Phase II increasing withdrawal of water from the Edwards Aquifer will be avoided, minimized, and/or mitigated as discussed above. Indirect threats to Aquifer-dependent species from water withdrawal can be effectively addressed on a regional, collective basis, and SAWS and the EAA are the two entities primarily responsible for implementing a regional conservation effort. EAA is currently drafting a regional habitat conservation plan, and if approved, will address this issue. However, EAA has limited authority to control water quality. As such the proposed development will maintain water quality by complying with the terms of the SAWS agreement, or through application of BMPs in addition to certain other local water quality controls for similar projects. The proposed site development should not significantly affect water quality parameters such as dissolved oxygen, bacteria levels, or other water quality parameters in downstream surface water segments. Since effects to on-site recharge and groundwater quality of the Glen Rose Formation from this project are not anticipated to be significant, the potential effects to the Edwards Aquifer should be negligible.

5.1.2.10 Socioeconomic Environment

The Proposed Alternative will result in an increase in jobs in the area. This alternative may also result in an increase in supportive businesses such as stores and restaurants. Along with an increased tax base, there may also be an increase in the need for road repairs and other public services in the areas. Off-site socioeconomic impacts are expected.

Once construction is completed, permanent jobs will continue in association with the operation of the resorts and other uses in the community. A hotel is estimated to employ approximately 900 employees with an annual operating payroll of $20,000,000. A golf course is estimated to employ approximately 150 employees with an annual operating payroll of approximately $5,000,000.

Additional benefits in the form of taxes would result. The projected property value to be taxed in 15 years is estimated to be $1,300,000,000. This results in estimated annual tax revenues for the

COSA, school districts, Bexar County, and the Hospital District of approximately $39,000,000 in property taxes and approximately $8,000,000 in hotel/motel taxes, if applicable. The hotels and golf courses would also generate significant sales tax revenues.

The construction of the hotels and golf courses would bring additional visitors, conventions, and golf tournaments to San Antonio. The local economic impact from spending by such hotel and golf visitors is estimated to be $180,000,000 annually.

5.1.3 Cumulative Impacts Analysis Overview

As defined in CEQ regulations (40 CFR §1508.7), "cumulative impact" is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

The following is a general overview of the cumulative impacts analysis undertaken in connection with the preparation of this EA/HCP. The cumulative impacts analysis for the Cibolo Canyon project considers the following: 1) the anticipated area within which the effects of the project will be felt; 2) impacts in that area resulting from the proposed project; 3) other actions – past, proposed, and reasonably foreseeable – that have had or are expected to have impacts in the same area; 4) impacts or expected impacts from these other actions; and 5) the cumulative impact that can be expected if the individual impacts are allowed to accumulate. Information pertinent to this analysis is not contained wholly within any particular chapter or section of this EA/HCP, but appears at various locations throughout the document and the overall record of this action. The purpose of this Section 5.1.3, however, is to provide a brief overview and summary of the analysis undertaken.

Area of Impacts

The area within which effects of the development of the Cibolo Canyon Property will be felt will vary, from resource to resource. Therefore, the expected area of impact will be discussed generally in this overview and further addressed for specific resources within the Alternatives sections (5.1- 5.4). Although each alternative would have different direct impacts, similar cumulative impacts are anticipated for all alternatives. The Cibolo Canyon Property is located within Bexar County, Precinct three, a growing, suburbanizing area of northern Bexar County. While the precise area within which project impacts may be felt varies from resource to resource, Bexar County, Precinct three is considered an area of sufficient scale within which to consider cumulative impacts on most, if not all, resources (Figure 9 - county's precincts and identifying Cibolo Canyon).

Project Impacts

Direct and indirect effects of the Proposed Alternative under consideration are described in previous sections of this EA/HCP.

Summary of Other Actions

The San Antonito-Bexar County MPO in coordination with other local governmental agencies prepared the Mobility 2025 Metropolitan Transportation Plan (San Antonio-Bexar County MPO,

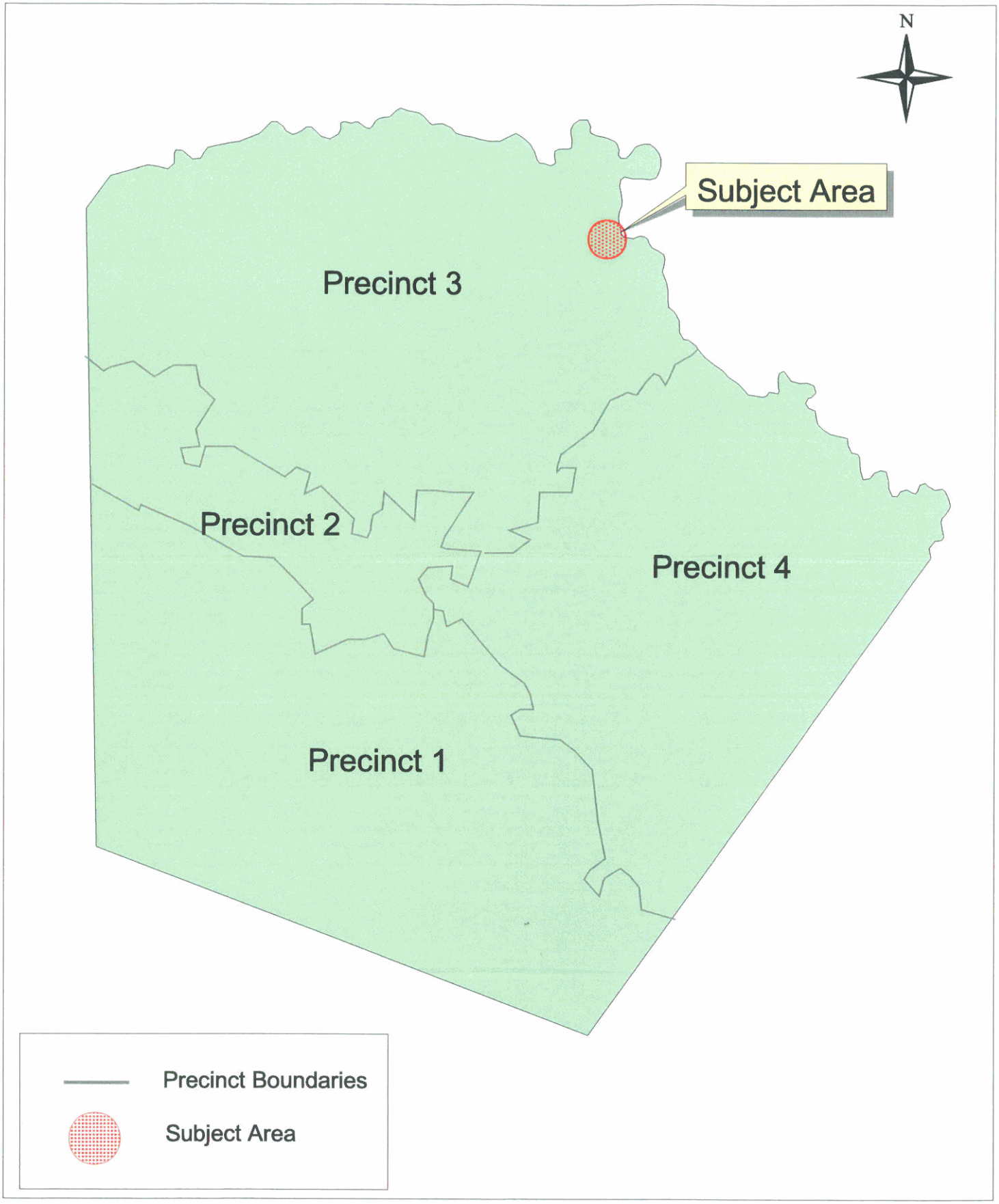

Figure 9
Bexar County Precincts

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a division of aci group, LLC

1999). This document is the MPO's basic framework for continuous, comprehensive, and coordinated regional transportation planning efforts for the next twenty-five years. MPO's comparison of the 1995 population and employment densities to the 2025 forecasts (from the demographic forecasting model), predict residential and employment developments to continue to grow northward in Bexar County. The population of Bexar County is expected to increase 27.6 percent between 2000 (~1.4 million) and 2010 (~1.78 million) and double before 2040 (~2.8 million) (City of San Antonio Planning Department, 2002).

In response to anticipated population growth and transportation needs Bexar County citizens voted to approve twelve road and bridge improvement projects valued at over $40,000,000 in November, 2003. These projects provide for the reconstruction of roads and improvements in the drainage in areas of high growth which support existing and proposed schools, improved driving and safety conditions, as well as supporting the economic development for Bexar County. Two of these road improvement projects, Borgfeld and Bulverde Roads, are located within Precinct 3 and are scheduled for completion in the second and fourth quarters of 2007, respectively (Bexar County, 2004).

In addition to transportation improvement projects, many new housing developments are existing, under construction, or platted within Precinct 3, including most of the areas surrounding Cibolo Canyon Property (Figure 10—identifying the surrounding developments):

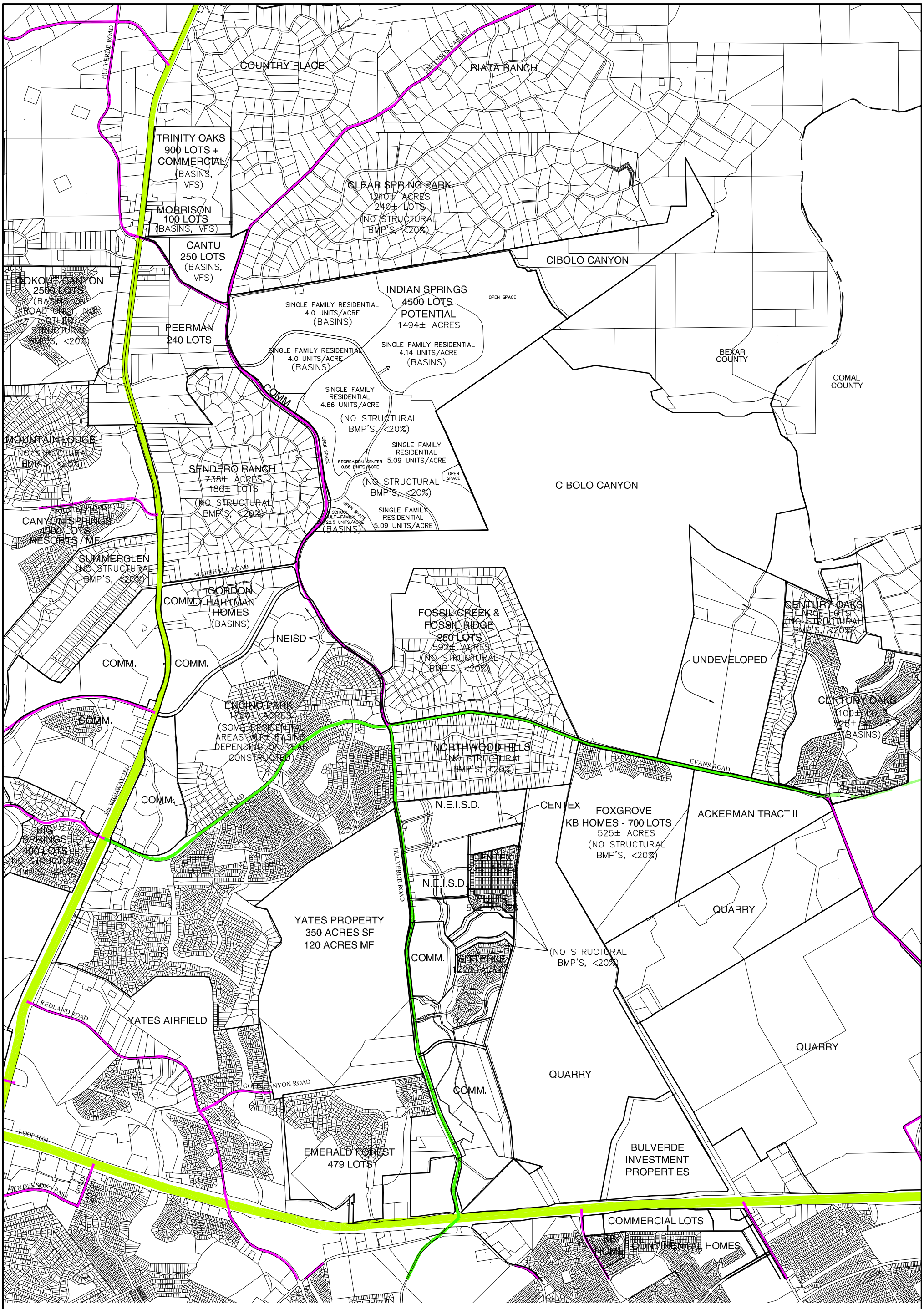
- Clear Springs Park to the north,
- Encino Park to the west,
- Sendero Ranch to the west and northwest,
- Indian Springs to the northwest,
- Fossil Creek to the south,
- Fossil Ridge to the southwest, and
- Century Oaks to the east,
- other large-lot properties that exist to the east and southeast, and several large-lot properties are located along the border of the Property to the east and northeast.

Impacts from Other Actions (individual and accumulated)

The planned and existing development around the Evans Road Tract portion of Cibolo Canyon and the planned development of the Evans Road Tract itself (Master Phase I and II) are typical of the suburbanization density occurring throughout northern and western Bexar County. The cumulative impact of these master planned communities includes the conversion of ranchland to suburbanized areas across much of Precinct three and northwestern Bexar County, with resulting reductions in overall open space and potential urbanization impacts on water and air quality, noise levels, and available habitat for the GCWA and other local wildlife. The average density of this suburbanization is one general measure of its potential effect on a wide variety of resources.

While it is expected that most of the area will become urbanized in the foreseeable future, this urbanization will likely occur at the relatively low densities that are typical of these suburban areas.

A recent analysis of existing and projected impervious cover within this region estimates that the Recharge Zone within Bexar County is approximately 22.3 percent impervious cover (see



REGIONAL AREA MAP

VFS = VEGETATIVE FILTER STRIP

NOTE: ALL COMMERCIAL SITES ASSUMED TO HAVE BASINS

NOTE: ACREAGE IS APPROXIMATE AND BASED ON INFORMATION FROM BEXAR APPRAISAL DISTRICT

SCALE : 1"=3000'

0' 3000' 6000'

FIGURE 10

PAPE-DAWSON ENGINEERS
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5.1.3.2). Under the Proposed Alternative, the site would be 15 percent or less impervious cover, representing approximately 3.5 percent of the total existing and planned conversion of undeveloped land to impervious cover (22.3 percent) within the Recharge Zone in Bexar County. After completion of the proposed development and all development presently planned for this area, the total impervious cover for the Bexar County recharge zone would be the 22.3 percent figure, above, with 90.5 percent of the area (71,803 acres (29,057 hectares)) involved in development of various intensities and 8,446 acres (3,418 hectares) remaining undeveloped. Of the developed acreage it is expected that 15,655 acres (6335 hectares) will be floodplain and community green spaces. (Pape Dawson, 2004)

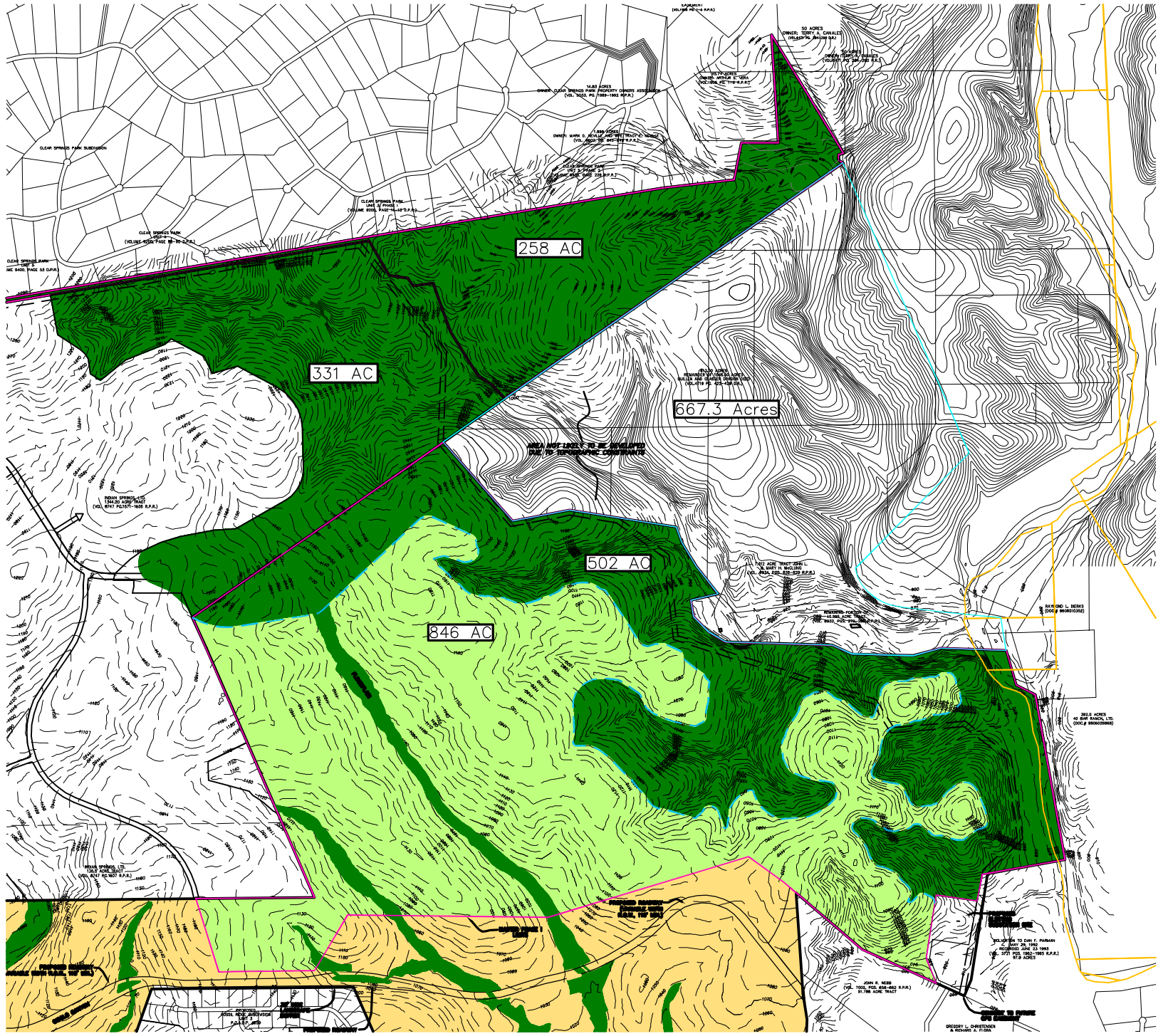
It is also true that potential cumulative impacts to various resources will be mitigated to a degree by existing regulatory and open space programs. For example, both the COSA and the Texas Commission on Environmental Quality regulate development for the protection of water quality. In addition, areas of endangered species habitat are subject to protection under the ESA, and, in fact, the developers of the Indian Springs project immediately adjacent to Cibolo Canyon have entered into a settlement with the Service establishing over 300 acres (121.4 hectares) of preserve for the GCWA. In addition, the COSA, working with entities like the Trust for Public Land and the Bexar Land Trust, implements active programs for the preservation of open space in the recharge and contributing zones of the Edwards Aquifer. One such program, referred to as Proposition 3, has resulted in the preservation of several thousand acres of open space.

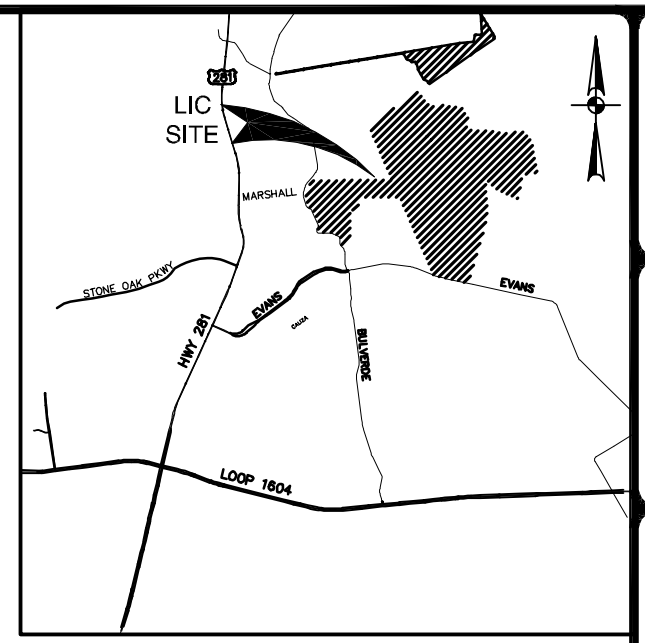
Although Master Phase I and the Evans Road Tract portion of Master Phase II are almost entirely surrounded by existing or planned development, the conserved areas under the Proposed Alternative are adjacent to other areas either already established as open space (e.g., the Indian Springs conservation area) or considered un-developable due to topographic and flood plain issues (as much as 650 acres (263 hectares)). The North Triangle Tract and portions of the Wolverton and Evans Road Tracts to be left undeveloped and preserved in perpetuity total 760 acres (Figure 11). Combining the 760 acres of conservation area of Master Phase II with the more than 300 acres of adjacent open space (Indian Springs) and the potential 650 acres (263 hectares) of land considered un-developable, would provide as much as 1,700 acres (688 hectares) of contiguous wooded open space (Figure 11). This large block of contiguous wooded acreage would be available for use by the GCWA and other local wildlife and would also have beneficial effects on regional air and water quality. The proposed development of the Cibolo Canyon Property provides an opportunity also to conserve a large block of ecologically valuable open space in perpetuity, which will mitigate to a degree the ongoing cumulative effects of urbanization in the area.

5.1.4 Cumulative Impacts Analysis for the Proposed Alternative

5.1.4.1 Vegetation

The approximately 1,896 total acres (767.3 hectares) within Master Phase I and II of disturbed vegetation would contribute little to the cumulative disturbance of these vegetation types in Bexar County that occurs from development and other land use changes of all kinds. The dedication of 940 acres (380.4 hectares) of open space and the Conservation Area within Master Phase I and II project areas would minimize any significant cumulative impacts to vegetation.





LOCATION MAP
NOT TO SCALE

SCALE : 1"=2000'

0' 2000' 4000'

FIGURE 11

REVISIONS:

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CIBOLO CANYON PROPERTY

JOB NO. 3538-00
DATE MARCH, 2005
DESIGNER CCT
CHECKED ... DRAWN MW
SHEET 1 OF 1

Date: May 11, 2005, 4:30pm User ID: MWright
File: H:\3538\00\Environmental\EA_HCP\050511 FINAL FIGURES\FIGURE 11.dwg

Based on an analysis prepared by Pape Dawson Engineers, Inc (2004) entitled Cumulative Impact Report, August 2004, which studied impervious cover estimates for existing developments and planned developments in the San Antonio area, it is estimated that the Recharge Zone within Bexar County is approximately 22.3 percent impervious cover (see 5.1.3.10). Under the Proposed Alternative, the site would be 15 percent or less impervious cover; therefore, the cumulative impact on vegetation from the development under the Proposed Alternative would represent approximately 3.5 percent of the total existing and planned conversion of vegetation to impervious cover (22.3 percent) within the Recharge Zone in Bexar County.

According to the 2003 American Forests' Urban Ecosystem Analysis, tree canopy cover within the San Antonio area and the Edwards Aquifer Recharge Zone (EARZ) is currently 27 percent and 43 percent, respectively (American Forests, 2003). Heavy tree canopy cover (areas with 50 percent or greater tree cover) has decreased by 22 percent in San Antonio within the last decade. The American Forests' analysis recommends maintaining an average 35 percent tree canopy citywide to aid in removing air pollutants and reducing storm water runoff (recommendations range from 15-45 percent depending on land use). The majority of the heavy tree canopy cover areas within the Property will be included in the 760 acres of GCWA mitigation under the Proposed Alternative. Overall tree canopy for the development and the Conservation Area of the Property will remain over 50 percent under the Proposed Alternative, exceeding the 45 percent recommended tree canopy within the EARZ.

A City Public Service electric transmission line construction project is underway on the Cibolo Canyon Property, generally along its north and easterly edges and extends both southeast and west from the site. City Public Service is presently consulting with the Service regarding this project, inasmuch as it includes some current clearing, construction equipment activity and related circumstances. Inasmuch as it is unrelated to the project, its cumulative effects to vegetation are expected to be minimal.

5.1.4.2 Wildlife

The proposed action would contribute to a cumulative reduction of habitat for some wildlife species when added to impacts from development and other land use changes in Bexar County. Wildlife species better adapted to urban and suburban habitat (generalists) may increase and exacerbate displacement of species intolerant to development, which may locally decrease. However, a viable amount of wildlife habitat will be maintained through open space and mitigation (940 acres) within Masters Phase I and II..

5.1.4.3 Threatened or Endangered Species

Golden-cheeked Warbler

Cumulatively, the proposed action may contribute to take of the GCWA and will reduce the overall habitat in Bexar County, particularly when added to other section 10(a)(1)(B) incidental take permits that may be issued by the Service and for activities of other developments that have not obtained authorization under the ESA.

To date, no incidental take permits for the GCWA have been issued in Bexar County. In the Travis/Williamson/Hays County areas, 117 incidental take permits and eight Biological Opinions for the GCWA have been issued. These 117 permits cover approximately 20,000 acres (8,094 hectares),. This acreage reflects the total area of properties and not an estimate of "take" in terms of habitat. As such, the total area of impacted GCWA habitat is substantially less. Additionally, much of this area is included within the 633,000-acre (256,172 hectares) area in Travis County covered by the Balcones Canyonlands Preserve regional 10(a)(1)(B) permit.

According to the GCWA Recovery Plan (USFWS, 1992), there are eight regions (recovery units) identified for GCWA recovery. The Property is located within recovery unit 6. The 1992 GCWA recovery plan requires that sufficient GCWA breeding habitat be protected to ensure the continued existence of at least one viable, self-sustaining population in each of the eight regions. Currently within recovery unit 6, the GCWA population utilizing Government Canyon State Natural Area (SNA) is being protected and monitored. Surveys conducted at Government Canyon SNA by Texas Parks and Wildlife Department (TPWD) have resulted in the location of approximately 30 occupied GCWA territories, and monitoring of this population will continue (TPWD, 2002). Of these surveys, most have been informally conducted, and only on portions of the Property. Only one thorough survey occurring on a small portion of the Property has been completed. It is therefore likely these 30 territories only represent a small percentage of the total number. Within recovery unit 6, ten years of survey data on the Camp Bullis Training Site show a stable to slightly increasing GCWA population between 1991 and 2000 (Fischer and Guilfoyle, 2001).

The recovery plan is however likely to be revised in the future. In response to this, and based on Landsat data and suggestions from the Golden-Cheeked Warbler Recovery Team, during a 1998 meeting, the Service redrafted the Golden-Cheeked Warbler Recovery Unit boundaries. In 2003, maps with the proposed boundary changes were sent to all Golden-Cheeked Warbler Recovery Team members for comment. These boundaries have not yet been officially approved but are likely to be incorporated into any revision. The new configuration would encompass the same total area within six recovery units instead of eight. Eight viable populations would still be necessary before down-listing would be considered. One viable population would be required for each of four units and two viable populations would be necessary in the two units considered to encompass the core range of the species. The two core revised recovery units are 3 and 5. Recovery unit 5 encompasses Bexar and Comal counties, almost all of Kendall County, the eastern portions of Bandera, Kerr, and Medina counties, southern portions of Blanco and Hays counties, and a very small portion of southeastern Travis County. The Cibolo Canyon Property is located within the revised, but not approved, recovery unit 5.

In 2002, a population viability analysis of GCWAs was conducted (Alldredge et al., 2002). This study focused on the Balcones Canyonlands National Wildlife Refuge (NWR) and Fort Hood GCWA habitat. The study concluded that unless a metapopulation is determined to exist, large patches (>3,000 breeding pairs in fragmented habitat or >1,000 breeding pairs in non-fragmented habitat) should be maintained for a viable GCWA population over a 100-year time frame. It is likely recovery unit 5 will be considered fragmented. Additional studies are currently underway to determine whether or not GCWA habitat patches large enough to sustain two populations with over 3,000 breeding pairs each are feasible in this recovery unit.

In addition to Government Canyon SNA and Camp Bullis, the mitigation lands that will be provided as a result of this process combined with other areas to be preserved on adjacent properties by others can combine to form the foundation of a new and potentially important third site of biologically valuable GCWA habitat in the San Antonio area.

Karst Invertebrates

No endangered karst invertebrates were identified on-site. No Service designated Critical Habitat for karst invertebrates exist on-site. Therefore, no cumulative impacts to karst invertebrates are anticipated as a result of the Proposed Alternative.

Edwards Aquifer

As described in Section 3.3.3., 3.7, and 5.1.1.3, regional efforts are expected to address the potential impacts to aquifer-related species from water quantity withdrawals. Regarding water quality issues, COSA, Edwards Aquifer Authority, SAWS, and the State of Texas (TCEQ) all have regulations, standards and BMP requirements in place whose purpose is to preserve water quality in this and other portions of the Edwards Aquifer. These regulations have all increased their requirements for water-quality related improvements for development in recent years, however the majority of development over the Edwards Aquifer was constructed prior to the years in which these regulations were promulgated and without any regulations or requirements for BMPs, buffer strips, or similar water quality related improvements. The Proposed Alternative is subject to the COSA Agreement that would place additional restrictions and requirements on the development. See Sections 4.1 and 5.1.1.9 for additional information regarding the best management practices and other measures to be used.

5.1.4.4 Wetlands

Potential impacts to waters within the adjacent Master Phase I area were authorized under nationwide permit 14, issued by the USACE on June 3, 2003. Any impacts to jurisdictional waters (including USACE regulated wetlands) within the Property would also be subject to authorization from USACE. No cumulative impacts to jurisdictional waters or wetlands are anticipated (see also Section 5.1.1.9).

5.1.4.5 Geologic Features and Soils

No significant cumulative impacts to geology and soils would occur as a result of the Proposed Alternative.

5.1.4.6 Land Use

The proposed action contributes to the conversion of undeveloped land to developed land in the COSA area. However, such development has been contemplated and planned by the COSA in its land use approvals and in the orderly extension of major water and wastewater utilities into this area in the last two decades to serve new growth in this region. No significant off-site cumulative impacts to existing or proposed land uses are expected to occur as a result of the proposed action. The majority of the properties adjacent to or in the vicinity of the Cibolo Canyon site are currently developed or have existing master plans for development in varying stages of

construction. The primary land use of surrounding properties is single-family residential. For these properties that are developed or are planned for development near the Cibolo Canyon site, the proposed action will not change or impact the use of those properties. Development of the Property will impact regional traffic loads (See Section 5.1.2.6).

5.1.4.7 Cultural Resources

No significant archeological sites were identified on this property. Therefore, the proposed action will not contribute to a cumulative reduction of archaeological sites that are eligible or potentially eligible for the National Register of Historic Places.

5.1.4.8 Air Quality

The MPO addresses the expected impacts of increased population and transportation needs on Bexar County's air quality. At the time of the study, the San-Antonio Bexar County area was considered by TCEQ as being in "near non-attainment" with the National Ambient Air Quality Standards (NAAQS). To date, San Antonio still holds near non-attainment status for ground-level ozone. Although San Antonio is in compliance with the one-hour ozone standard, it exceeds the eight-hour standard (TCEQ, 2004). A Clean Air Plan for the San Antonio Metropolitan Statistical Area was prepared by the AIRC of the Alamo Area Council of Governments. The Plan is designed to enable a local approach to ozone attainment and to encourage early emission reductions that will help keep the San Antonio area in attainment of the 1-hour ozone NAAQS and ensure attainment of the 8-hour ozone NAAQS. The Clean Air Plan also incorporates the Early Action Compact for the San Antonio area. The Early Action Compact protocol was endorsed by EPA Region 6 on June 19, 2002, and is designed to develop and implement control strategies, account for growth, and achieve and maintain the 8-hour ozone standard (AIRC, 2002). Attainment with the 8-hour ozone standard is scheduled no later than December 31, 2007. The Cibolo Canyon Property is located in an area of projected growth by MPO and would be subject to all standards of the EPA and the Early Action Compact.

The Proposed Alternative will slightly contribute to degradation of air quality in the San Antonio area primarily through an increase in automobile emissions. The degree of impact will depend upon existing and future air quality requirements for construction activities and automobiles. Significant impacts will likely be offset by the continued trend for increases in regulation of automotive and other emissions as described above.

5.1.4.9 Water Resources and Water Quality

Cumulative impacts to surface water or groundwater as a result of existing development and the proposed action are expected to continue. Unlike much of the existing development within this area, the proposed development will be conducted in accordance with TCEQ rules for development on the Edwards Aquifer Recharge and Contributing Zones, including appropriate use of additional structural best management practices as described elsewhere herein (Sections 4.1 and 5.1.1.9). In addition to the TCEQ requirements, the COSA Agreement stipulates additional water quality control measures for the golf village project. The proposed action

represents a small percentage of the total development on the Recharge and Contributing Zones within Bexar County.

Within Bexar County, the Edwards Aquifer Recharge Zone is officially mapped as covering approximately 80,249 (32,476 hectares) acres and the Edwards Aquifer Contributing Zone covers approximately 112,686 acres (45,603 hectares), for a total of 192,935 acres (78,080 hectares). Approximately 2,548 acres within Master Phase I and II of the LIC Property is mapped as being within the Edwards Aquifer Recharge Zone. However, extensive on-site geological investigations have shown this mapping to be incorrect for this property. This mapped acreage represents 3.2 percent of the Edwards Aquifer Recharge Zone within Bexar County. In actuality the Property acreage actually located over the recharge zone is zero. Approximately 307 acres within Master Phase II of the LIC property is mapped as being within the Edwards Aquifer Contributing Zone. This mapped acreage represents 0.3 percent of the Edwards Aquifer Contributing Zone within Bexar County. Combined, the property would represent 1.48 percent of the Recharge and Contributing Zone total acreage within Bexar County if the map, which is based on anecdotal information, were correct for this site. The property is located within two of the six Bexar County Recharge and Contributing Zone watersheds, the Salado Creek watershed and the Cibolo Creek watershed. The Salado Creek watershed within Bexar County consists of approximately 65,774 acres (26,618 hectares), of which approximately 1,736 acres (702 hectares) (or 2.6 percent) is within the LIC property. The Cibolo Creek watershed within Bexar County consists of approximately 41,156 acres (16,656 hectares), of which approximately 1,119 acres (453 hectares) (or 2.7 percent) is within the LIC property.

Approximately 45 percent of the Recharge Zone within Bexar County is currently developed and an additional 24.5 percent is planned for development through the recent submittal of master plans and development plans to the COSA or other review agencies. Approximately 19.5 percent of the Recharge Zone in Bexar County is dedicated as open space and preserve lands, such as Camp Bullis or Government Canyon SNA, or is major floodplain areas, such as behind the San Antonio River Authority's Salado Creek flood dams (Pape Dawson, 2004). Therefore approximately 10.5 percent of the Recharge Zone within Bexar County remains to be planned for development or preservation, and it is only this small percentage that will have been or will be developed with any significant provisions for storm water runoff filtration or other methods of water quality treatment. In any event, none of these other pending communities will likely conform to the water quality provisions which are included in this Proposed Alternative.

Based on impervious cover estimates for existing developments and planned developments, it is estimated that the Recharge Zone within Bexar County consists of approximately 22.3 percent impervious cover (Pape Dawson, 2004). The total combined Recharge Zone and Contributing Zone acreage within Bexar County is estimated to be approximately 13.68 percent impervious cover, excluding the proposed action. Under the Proposed Alternative, the site would be 15 percent or less impervious cover. Development of the Proposed Alternative increases the overall impervious cover on the Edwards Aquifer Recharge Zone and Contributing Zone within Bexar County, as mapped, by 0.37 percent. The total impervious cover within the recharge zone as it is presently mapped after this development would be 45.37 percent. However, as stated above the official map has been shown to be incorrect as it specifically relates to this site, so there will be no increase of impervious cover over the recharge zone by the construction of Master Phase II.

The TCEQ requires developments on the Recharge and Contributing Zones to control discharge of pollution after construction either through the use of structural best management practices such as sedimentation/filtration basins, or by limiting the impervious cover to less than 20 percent of the site.

In addition to and above and beyond the requirements of the TCEQ, the COSA Agreement stipulates additional water quality protection measures that will regulate the quality of storm water on-site as well as storm water runoff leaving the Property from the golf course construction and operation. In addition, the COSA Agreement limits the amount of water utilized by the Proposed Alternative and requires all water to be supplied and controlled by SAWS. Surface water and groundwater quality monitoring conducted on site, will identify potential concerns from a golf village golf course construction and operation that can then be addressed by land management practices to prevent on-site and off-site impact to water quality, per the COSA Agreement.

5.1.4.10 Socioeconomic Environment

The Proposed Alternative will contribute to the increase in population and traffic in northern Bexar County, which will, over time, become even more urbanized as new development continues to occur. The Proposed Alternative will also result in an increase in jobs in the area (See Section 5.1.1.10). This alternative may also result in an increase in supportive businesses such as stores and restaurants. There may also be an increase in the need for road repairs and other public services in the area, along with an increased tax base.

5.2 Alternative Two – Existing, approved Full Development Plan on Evans Road Tract with Wolverton Tract and The North Triangle Tract

5.2.1 Direct Impacts

Disturbances resulting from the development and construction of Master Phase II will disturb vegetation on-site and reduce habitat for wildlife, including the destruction and modification of GCWA habitat. Implementation of Alternative Two is expected to offset a portion of such impacts through avoidance and/or minimization efforts in some steep canyon areas identified as GCWA habitat.

5.2.1.1 Vegetation

Alternative Two would remove, alter, or further fragment approximately 1,535 acres (621 hectares) of vegetation. Within the Development Area, native vegetation will be modified and replaced with homes, structures of various sorts, and landscaped areas. Landscaping will be performed with native vegetation.

5.2.1.2 Wildlife

Wildlife within those areas planned for development would largely be displaced to adjacent areas. Such displacement could result in increased competition for breeding, nesting, and foraging habitat, as well as cover, in adjacent undisturbed habitat. Outside of designated open space, the